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Creators: Bennett, Leo C.

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A Change at the Radio Station

By LEO C. BENNETT, E.E. II

"Full time coming to your local radio station, at a new spot on your dial," says the advertisement. These words do not represent a whim of the broadcasting company. The permission of the F.C.C. (Federal Communications Commission) to make a change in the operation of a radio station is not lightly given.

The portion of the radio spectrum allotted for standard broadcast use extends from 550 to 1600 kilocycles inclusive. This band is divided into 106 channels spaced at intervals of ten kilocycles. Since there are about a thousand broadcast stations in the United States and only 106 channels available, the F.C.C. has a difficult task in keeping interference between stations at a minimum. Several stations can use the same frequency if their geographical separation is great enough. The draw back to this arrangement is that at night any station is heard over a greater area,

so that stations which do not interfere with each other during the day will do so at night.

Certain high-powered broadcast stations are given a clear channel. Either no other station is assigned to that channel or it is shared in daylight only by a distant medium—or low-powered station. On regional channels, as the name suggests, medium-powered stations serve a fairly large area. Local channels have many low-powered stations, each serving one city or town and its suburban and rural areas. On both 1240 and 1450 kilocycles, for example, there are approximately seventy-five local stations. Any station may be required to reduce power or to use a directional antenna system after sunset to reduce interference.

Residents of the Columbus area know that some radio stations have to sign off at sunset. The Ohio State University station, WOSU, shares

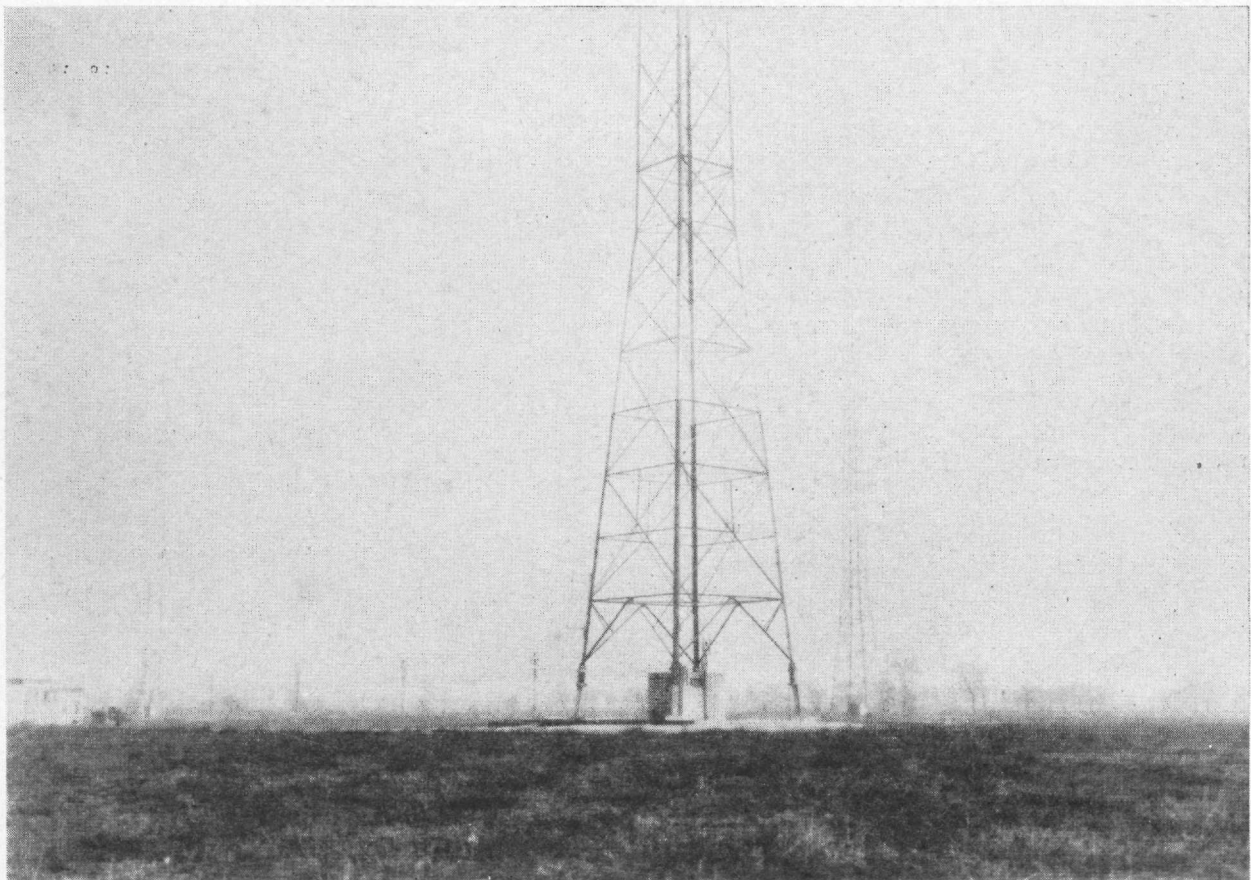


Figure 1—The three towers which make up the directional antenna system at WHKC, seen from the west of tower No. 2. The building at the left is the transmitter house.

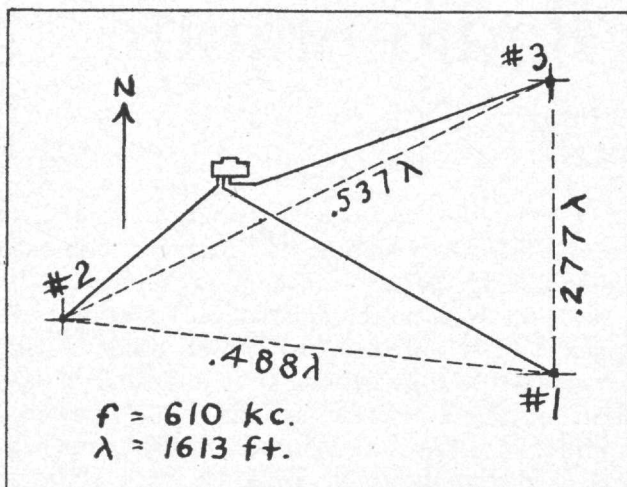


Figure 2—Tower layout at WHKC.

the clear channel of WBAP in Fort Worth, Texas. This limits WOSU to daytime broadcasting. Another Columbus station, WHKC, was also until recently on a clear channel with KFI in Los Angeles. It has now moved to a regional channel in order to obtain full-time privileges. This change is a typical example of the procedure involved in setting up or altering the operation of a broadcasting station.

Beginning in 1932, the owners of WHKC spent many years and many thousands of dollars trying to have the 640 kilocycle channel changed from clear to regional status so that they might operate day and night. Their efforts were fruitless, and offers to use an antenna system which would limit radiation toward the west were rejected. Section 3.24 of the F.C.C. Rules and Regulations states that "An authorization for a new standard broadcast station or increase in facilities of an existing station will be issued only after a satisfactory showing has been made in regard to the following, among others:

(a) That the proposed assignment will tend to effect a fair, efficient, and equitable distribution of radio service among the several states and communities.

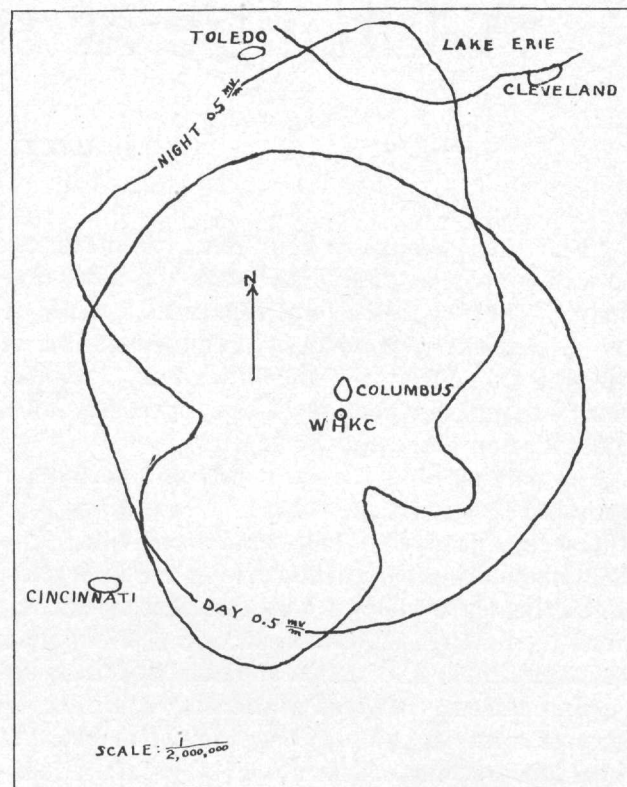
(b) That objectionable interference will not be caused to existing stations or that if interference will be caused the need for the proposed service outweighs the need for the service which will be lost by reason of such interference.

(g) That the public interest, convenience, and necessity will be served through operation under the proposed assignment."

These standards were not met in the proposals that were made.

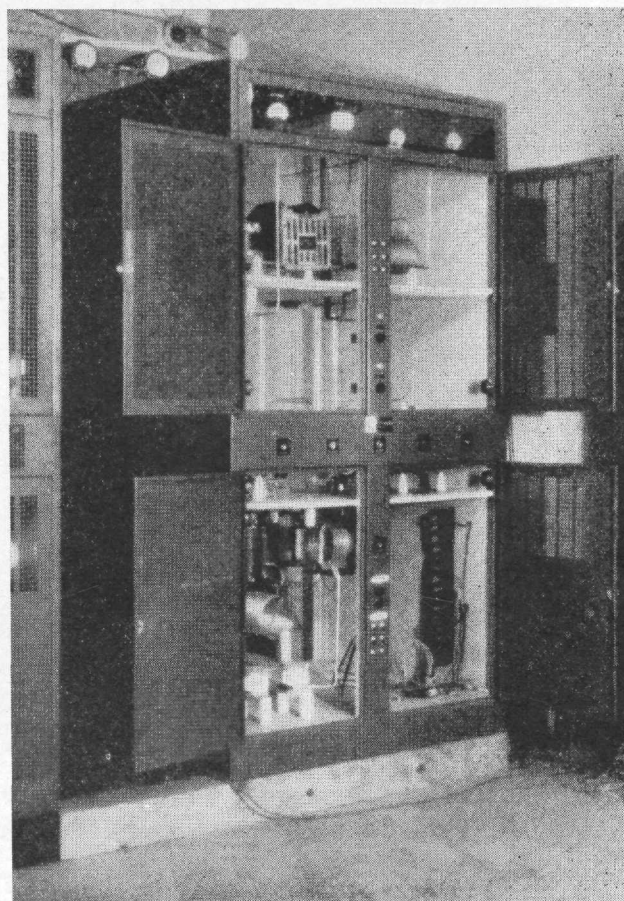
The next step was to look for a regional channel on which a station could be set up in central Ohio without causing undue interference to sta-

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(Above) Figure 3—Day and night field patterns of WHKC. Reception is equally strong at all points along the contour line.

(Below) Figure 4—The coils and condensers in this unit at WHKC divide the power from the transmitter among the three towers and also shifts the phase of that for towers two and three.



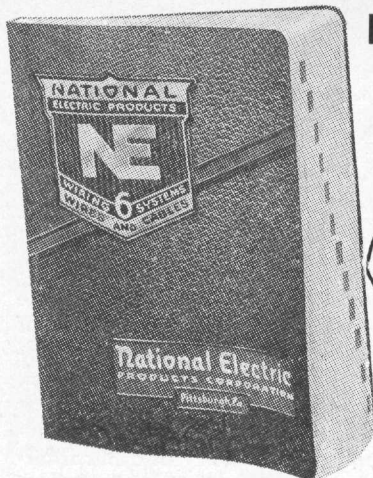
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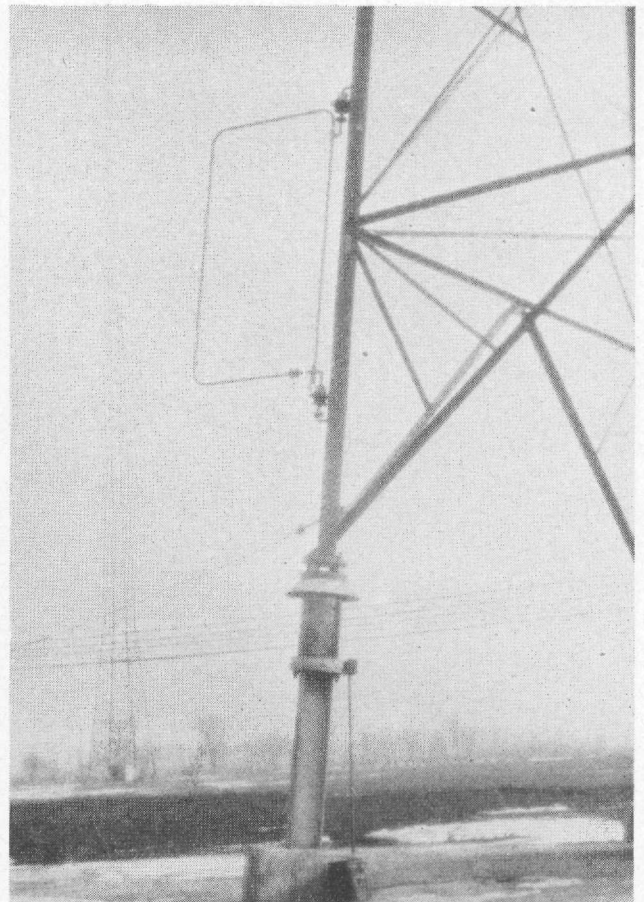


Figure 5—Pickup loop for the phase monitor. There are identical ones on each of the other towers.

A CHANGE AT THE RADIO STATION

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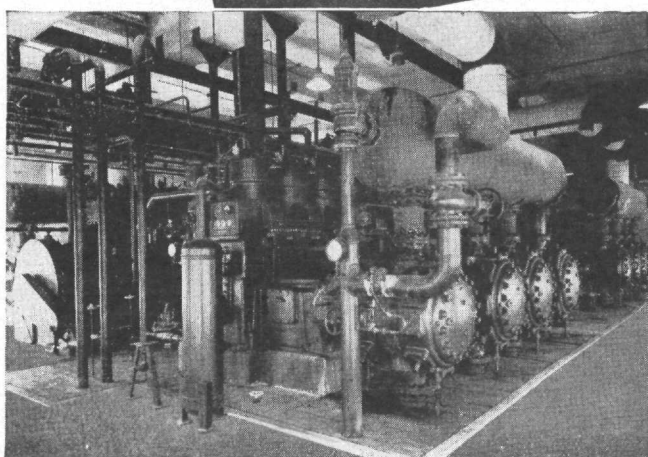
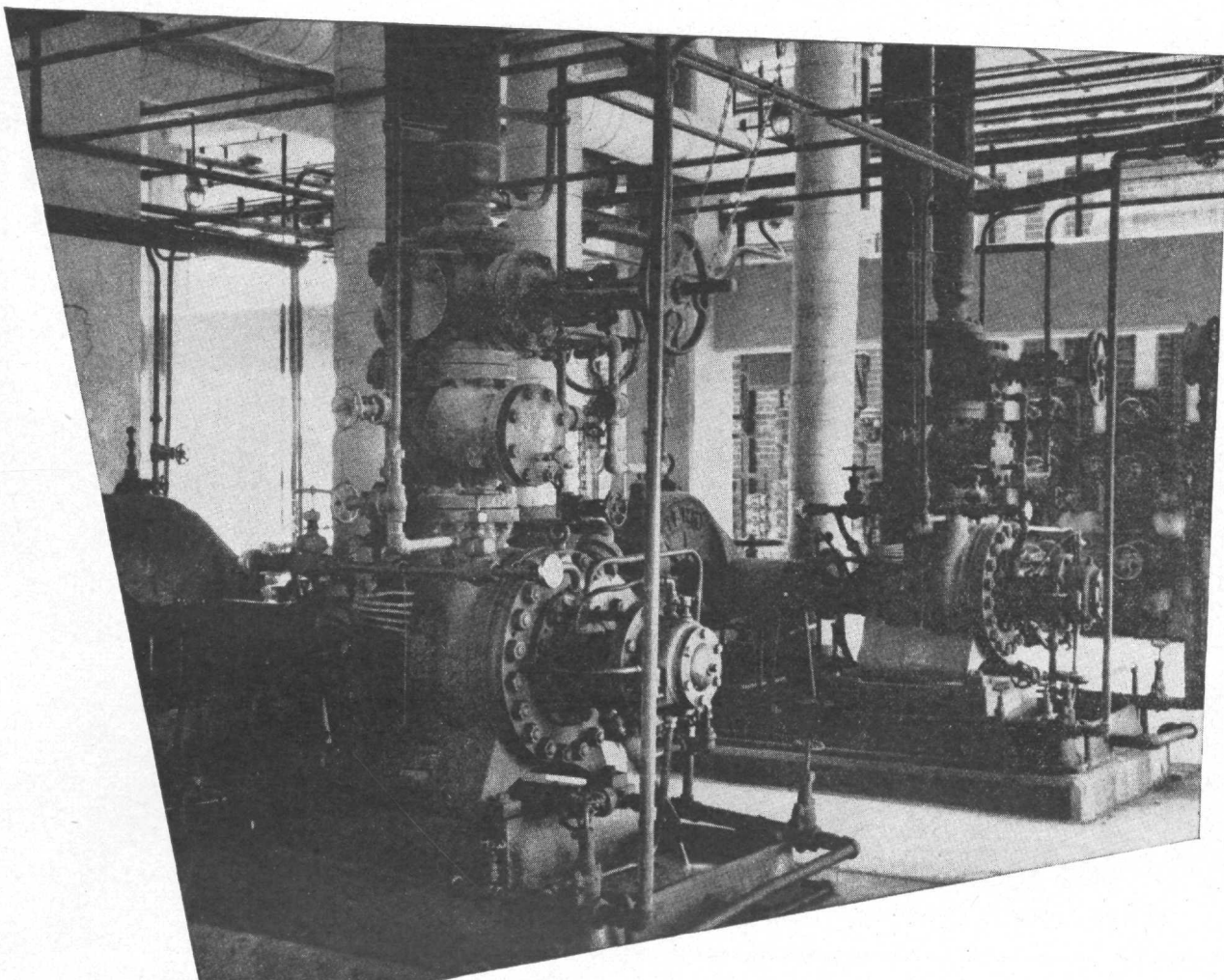
tions already using that frequency. On 610 kilocycles were:

WIOD, Miami, Florida
WIP, Philadelphia, Pennsylvania
WAYS, Charlotte, North Carolina
WMUR, Manchester, New Hampshire
WSGN, Birmingham, Alabama
WDAF, Kansas City, Missouri
KDAL, Duluth, Minnesota

A thousand watt station in Columbus would not interfere with any of these stations during the day, but at night it would. It was considered feasible to design an antenna system which would permit night-time operation without interference.

The maximum permissible radiation in the direction of each of the above stations was calculated, and plans were drawn up for a three-tower antenna system which would suppress radiation in the proper directions. The tower layout is shown in figs. 1 and 2, and the predicted field pattern in fig. 3. During the day only tower

(Please turn to page 32)



Altogether 24 Clark Compressors, totaling 15,600 B.H.P., service the Cities Service 100-Octane and Butadiene Plant at Lake Charles, Louisiana. They are grouped to function in four different processes; namely, Catalytic Cracking, Alkylolation, Butadiene and De-Asphalting.

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A Change at the Radio Station

(Continued from page 28)

No. 2 is used, giving nearly uniform radiation in all directions. At night all three towers are supplied with power of the correct magnitude and phase difference to give the desired effect. The F.C.C. authorized this change in April, 1944, but wartime shortages and restrictions impeded construction so that it was not until January, 1945, that everything was ready. Extensive measurements showed that the predicted radiation pattern was obtained, so WHKC started full-time operation on 610 kilocycles on February 25, 1945.

Mad wife (to late husband):
"What does the clock say?"

Quite plastered hubby: "It shay tick took and little doggies shay 'bow wow' and cows shay 'moo-moo' and little pushy cats shay 'meow-meow.' Now are you satisfied."—*Penn. Triangle*.

Mrs. Jones was spending a day in bed with a severe cough, and her husband was working in the back yard, hammering nails into some boards. Presently his neighbor came over.

"How's the wife?" he said.

"Not very well." Said Jones.

"Is that her coughin'?"

"No, you fathead," replied Jones, "it's a hen house."

"I just bought a skunk."

"Where ya gonna keep him?"

"Under the bed."

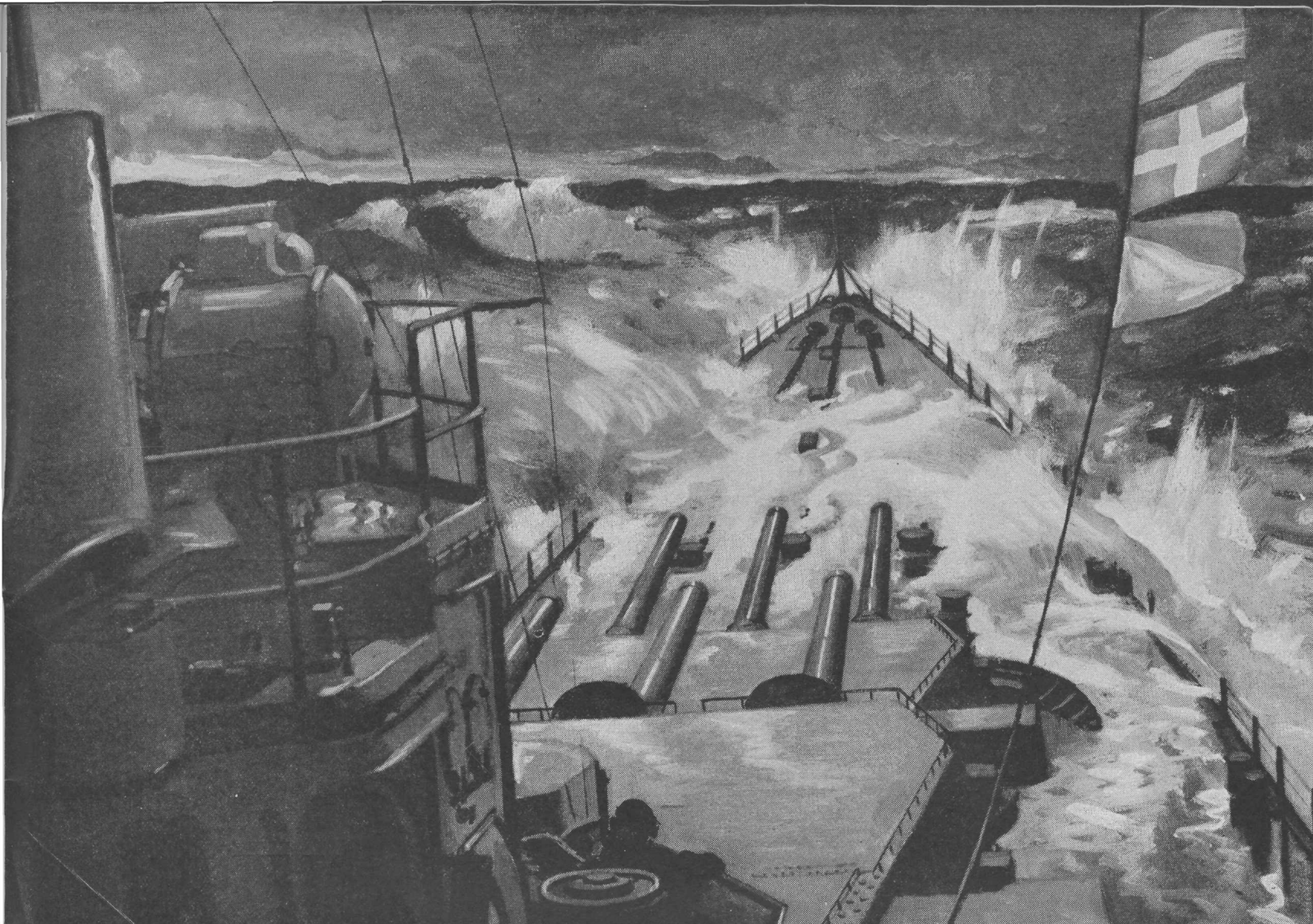
"What about the awful smell?"

"He'll have to get used to it like I did."

He: "Look at that homely woman."

She: "Remember, beauty is only skin deep."

He: "Yeh, and if she was my wife, I'd skin her."



WHY A BATTLE WAGON WEARS 4,000 SAPPHIRES

THE DELICATE PRECISION instruments so essential to the navigation of ships of the sea—and ships of the air—are dependent for accuracy on jewel bearings. There are 4,000 of them in a battleship.

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This unusual UCC research project led to the quantity production of Linde sapphire and Linde ruby. These are produced in the form of a single crystal shaped like a cylinder—known as a boule (pronounced “bool”)—and also in the form of rods of varying sizes, for more efficient and economical fabrication.

In addition to its indispensability in bearings for military instruments, Linde sapphire already is being used

by industry to combat wear in precision gauges, cutting tools, thread guides for textile mills, barometers, compasses, and watches. Phonograph needles that last indefinitely are another interesting use.


American synthetic sapphire production indeed is a tribute to American ingenuity, and promises much for the Nation's postwar progress.

For additional information send for the folder P-4 “Synthetic Sapphire Production.”



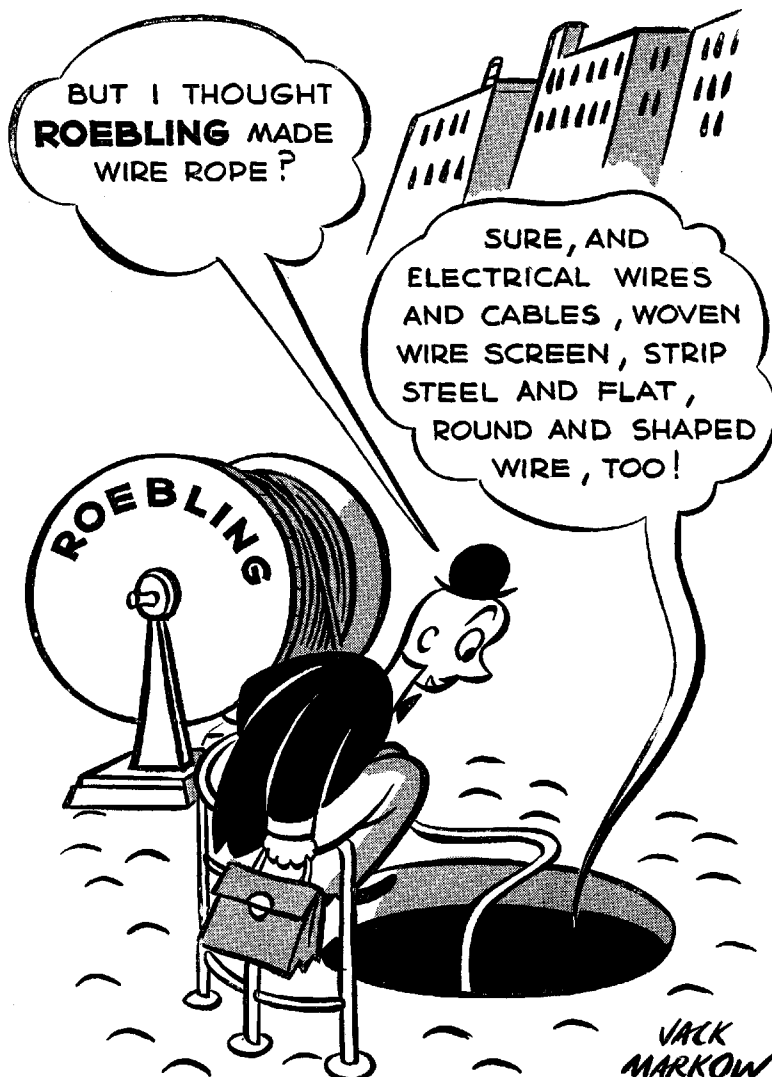
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The tax assessors were called upon to determine just where the newly purchased farm a little old lady had bought lay, whether in the United States or in Canada.

After much surveying, she was told that it was right on the Canadian border in the United States. The little old lady heaved a sigh of relief. She said, "I'm so glad. I've heard that the winters in Canada are SO severe!"

It finally happened. A school-marm we know told us. It happened during the rush for gas coupons the first time. She looked up at the shy, grinning man standing before her, and said, "At last, Mortimer, I can give you an A!"

"Did you hook the screen door?"

"I didn't know it was missing."

Here's a definition of a soap opera: A woman crying with an opening and closing commercial.

It isn't a sign of cold weather when bees cluster together. In fact, it's swarm.

Mary had a little lamb,
She tied it to a heater;
Every time he turned around
He burned his little seater.

She was only a moonshiner's daughter, but he loved her still.



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